DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 4, 8, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magee et al (5,835,493), and further in view of Park (5,953,489).

Regarding claims 1 and 4, Magee et al disclose a stream converting and recording method comprising:

- separating a first transport stream into a first TS packet string formed from TS packets that have a prescribed packet identifier (Col 9, lines 22-26 "Depending on the PID of each transport packet, the DLM 110 extracts and transfers the transport packet onto the DM bus for assembly into the outputted remultiplexed transport stream by the scheduler 141") and a second TS packet string formed from TS packets that do not have the prescribed packet identifier (Col 9, lines 26-28 "Furthermore, depending on the PID of each transport packet, the DLM 110 extracts and captures the transport packet for transfer on the C bus");

- extracting reference time information from the first transport stream so as to produce reference time from the reference time information (Col 12, lines 33-35 “each transport stream carries PCR’s for recovering a program clock of each program carried therein”);
- determining, with reference to the reference time, time of receipt of a TS packet including a head byte of a PES packet in the first TS packet string as first time of receipt (Col 12, lines 42-43 “the DLM 110 keeps track of the time each transport packet carrying a PCF is received”);
- determining, with reference to the reference time, time of receipt of a head byte of each TS packet forming the second TS packet string as second time of receipt (Col 12, lines 44-45 “The DLM 110 also keeps track of when the PCR bearing transport packet is transferred on the DM bus”); and
- multiplexing the produced third TS packet string and the second TS packet string so as to produce a second transport stream (Col 8, lines 1-4 “a flexible remultiplexer architecture is provided for remultiplexing one or more higher layered transport streams to selectively include one or more programs, or elementary streams of programs, carried therein”).
- wherein in the packet multiplexing step, time of receipt of a TS packet including a head byte of a PES packet in the third TS packet string is made to match the first time of receipt (Col 15, lines 12-14 “The receipt time, as indicated by a free running clock at the PCR fixer 230 is also stored with the PCR of the transport packet” and Col 15, lines 29-32 “The PCR fixer 230

outputs this new PCR to the DM bus section 300 where it is appended in place of the current PCR of the transport packet transferred from the DM FIFO 228"), and time of receipt of a TS packet of the second TS packet string is made to match the second time of receipt (Col 12, lines 44-45 "The DLM 110 also keeps track of when the PCR bearing transport packet is transferred on the DM bus")

- Magee discloses converting a bit rate of a packet string so as to produce another packet string (Col 3, lines 39-41 "The video preprocessor module 17 performs different kinds of analysis and modification of the inputted digital video such as sample rate conversion"), but does not specifically disclose converting the bit rate of a compressed stream.

  Park teaches the conversion of a bit rate of a packet string (Col 5, lines 63-65 "A FIFO 204 converts the variable rate bit stream multiplexed in multiplexer 203 to a constant rate bit stream" as well as the matching the time of receipt of the stream newly generated stream to that of the time of receipt of the original stream (Col 6, lines 59-61 "When the next transport packet does arrive, the time stamp for the respective transport packets is output in S_4, as shown in signal 5 of FIG. 6").

As suggested by Magee and taught by Park, modifying the bit rate of a program stream in a multiplexed stream, and returning the modified stream to the multiplexed stream provides the user with a way to control channel utilization, which prevents uncontrolled loss of data.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Magee in order to modify the bit rate of a program stream in a multiplexed stream and return the modified stream to the multiplexed stream.

During interviews with the Applicant's Representative, it was noted that the Applicant considers the invention to be the nexus of bit-rate conversion of the first TS packet string and the revision of the time of receipt of the bit-rate converted packet string. Park teaches such a nexus, as analyzed and discussed above.

Regarding claim 3, Magee et al disclose a stream converting method comprising:

- delaying the reference time by a prescribed time so as to produce delayed reference time (Col 7, lines 28-31 "the PCR fixer determines the "dwell" time, or transport packet delay incurred within the remultiplexer, from the recorded time and the current time of the local clock"),
- storing the second TS packet string, the second time of receipt, and the delayed reference time into buffer ((Col 12, lines 44-45 "The DLM 110 also keeps track of when the PCR bearing transport packet is transferred on the DM bus" and Col 12, lines 31-32 "packets may be buffered or enqueued in the DLM 110 for some time") and
- outputting a TS packet corresponding to the second time of receipt from the buffer when the delayed reference time matches the second time of receipt (Col 12, lines 44-49 "Prior to transfer, the DLM 110 determines the 'dwell' time or time in which the PCR bearing transport packet has been enqueued in

the DLM 110. This dwell time is added to the PCR of the transport packet prior to transfer on the DM bus").

Regarding claims 8 and 9, Magee et al disclose a stream converting apparatus comprising:

- a packet separating section for separating a first transport steam into a first TS packet string formed from TS packets that have a prescribed packet identifier (Col 9, lines 22-26 "Depending on the PID of each transport packet, the DLM 110 extracts and transfers the transport packet onto the DM bus for assembly into the outputted remultiplexed transport stream by the scheduler 141") and a second TS packet string formed from TS packets that do not have the prescribed packet identifier (Col 9, lines 26-28 "Furthermore, depending on the PID of each transport packet, the DLM 110 extracts and captures the transport packet for transfer on the C bus");
- means for extracting reference time information from the first transport stream so as to produce reference time from the reference time information (Col 12, lines 33-35 "each transport stream carries PCR's for recovering a program clock of each program carried therein"),
- means for determining, with reference to the reference time, time of receipt of a TS packet including a head byte of a PES packet in the first TS packet strings as first times of receipt (Col 5, lines 9-11 "The PCR insertion circuit 45 inserts as PCR's the count of the STC 43 in the appropriate field of transport packets received thereat at the appropriate time");

- means for determining, with reference to the reference time, time of receipt of a head byte of each TS packet forming the second TS packet string as second time of receipt (Col 5, lines 9-11 “The PCR insertion circuit 45 inserts as PCR's the count of the STC 43 in the appropriate field of transport packets received thereat at the appropriate time”);
- a packet multiplexing section for multiplexing the third TS packet string output from the bit-rate converting section and the second TS packet string output from the packet separating section so as to produce a second transport stream (Col 8, lines 1-4 “a flexible remultiplexer architecture is provided for remultiplexing one or more higher layered transport streams to selectively include one or more programs, or elementary streams of programs, carried therein”);
- a means for delaying reference time represented by the reference time information by a prescribed time so as to produce delayed reference time (Col 12, lines 44-48 “Prior to transfer, the DLM 110 determines the ‘dwell’ time or time in which the PCR bearing transport packet has been enqueued in the DLM 110”); and
- a recording control section for determining, with reference to the delayed reference time, time of receipt of each TS packet forming the second transport stream (Col 12, lines 48-49 “This dwell time is added to the PCR of the transport packet prior to transfer on the DM bus”).

- wherein the packet multiplexing section makes time of receipt of a TS packet including a head byte of a PES packet in the third TS packet string match the first time of receipt and makes time of receipt of a TS packet of the second TS packet string match the second time of receipt in multiplexing (Col 15, lines 12-14 "The receipt time, as indicated by a free running clock at the PCR fixer 230 is also stored with the PCR of the transport packet" and Col 15, lines 29-32 "The PCR fixer 230 outputs this new PCR to the DM bus section 300 where it is appended in place of the current PCR of the transport packet transferred from the DM FIFO 228").
- Magee et al suggest recording the output (Col 5, lines 29-30 "The output formatter converts the transport packet data into a format suitable for transfer to a downstream device"), but do not specifically disclose that device as a recording medium.

  The examiner takes official notice that devices for recording packetized video and audio data are well-known, widely used, and commercially available to the general public, and provide a means for storing audio and video programs for viewing at times convenient to the user.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Magee et al to include recording of the remultiplexed bit stream.

- Magee discloses converting a bit rate of a packet string so as to produce another packet string (Col 3, lines 39-41 "The video preprocessor module 17

performs different kinds of analysis and modification of the inputted digital video such as sample rate conversion"), but does not specifically disclose converting the bit rate of a compressed stream.

Park teaches the conversion of a bit rate of a packet string (Col 5, lines 63-65 "A FIFO 204 converts the variable rate bit stream multiplexed in multiplexer 203 to a constant rate bit stream") as well as the matching the time of receipt of the stream newly generated stream to that of the time of receipt of the original stream (Col 6, lines 59-61 "When the next transport packet does arrive, the time stamp for the respective transport packets is output in S_4, as shown in signal 5 of FIG. 6").

As suggested by Magee and taught by Park, modifying the bit rate of a program stream in a multiplexed stream, and returning the modified stream to the multiplexed stream provides the user with a way to control channel utilization, which prevents uncontrolled loss of data.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Magee in order to modify the bit rate of a program stream in a multiplexed stream and return the modified stream to the multiplexed stream.

During interviews with the Applicant's Representative, it was noted that the Applicant considers the invention to be the nexus of bit-rate conversion of the first TS packet string and the revision of the time of receipt of the bit-rate converted packet string. Park teaches such a nexus, as analyzed and discussed above.

Regarding claim 11, Magee et al disclose a stream converting method wherein in the packet multiplexing step, the second TS packet string is multiplexed preferentially over the third TS packet string (Col 9, line 67 – Col 10, line 5 "Note that only selected transport packets of the received transport packets are transferred via the DM bus. Thus, the remultiplexed transport stream contains only selected transport packets for which a transfer indication was provided, namely, those transport packets containing the desired ESs and PSI").

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination as applied to claims above, and further in view of Slattery et al (6,148,082).

Regarding claim 12, the combination is silent regarding a stream converting method further comprising a step of determining the prescribed packet identifier, wherein in the identifier determining step, determining is performed based on a bit rate of the first transport stream.

Slattery et al teach the determination of a packet identifier that is based on a bit rate of the transport stream (Col 31, lines 15-21 "bit rate information can be obtained from the processor 160 if not already known. For example, the processor can execute a PID handler subroutine that determines the bit rate (or transport packet rate) of each program from receipt time stamps assigned to each transport packet of each program bearing a PCR").

As taught by Slattery et al, the determination of a packet identifier based on a bit rate of the transport stream is well known, providing the processor with a convenient means of providing PCR adjustment.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination in order to include a determination of identification based on the bit rate of the transport stream.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES A. FLETCHER whose telephone number is (571)272-7377. The examiner can normally be reached on 7:45-5:45 M-Th, first Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thai Tran can be reached on (571) 272-7382. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JAF
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